

In re STEELE, MILLS, AND LEIS, 134 USPQ 292 (CCPA 1962)

In re STEELE, MILLS, AND LEIS

**(CCPA)
134 USPQ 292**

Decided July 25, 1962

Appl. No. 6719

U.S. Court of Customs and Patent Appeals

Headnotes

PATENTS

1. Court of Customs and Patent Appeals--In general (§ 28.01)

Patentability--Invention--In general (§ 51.501)

Pleading and practice in Patent Office--Rejections (§ 54.7)

Considerable speculation as to meaning of terms employed and assumptions as to scope of claims were made by examiner and Board; they were wrong in relying on speculative assumptions as basis for rejection under 35 U.S.C. 103; court is in a quandary as to what is covered by claims; substantial confusion as to interpretation of claims arose and has continued because claims do not particularly point out and distinctly claim invention as required by 35 U.S.C. 112; rejection is reversed because it is based on unsupported speculative assumptions; this is not to be construed as meaning that court considers claims to be patentable as presently drawn; claims should be reviewed to insure compliance with 35 U.S.C. 112.

Particular patents--Polyoxyalkylene

Steele, Mills, and Leis, Polyoxyalkylene Products, rejection of claims of application reversed.

Case History and Disposition:

Appeal from Board of Appeals of the Patent Office.

Application for patent of Arthur B. Steele, Jr., Edward J. Mills, Jr., and Donald G. Leis. Serial No. 532,283, filed Sept. 2, 1955; Patent Office Division 38. From decision rejecting claims of application, applicants appeal. Reversed; Martin, Judge, concurring with opinion; Worley, Chief Judge, dissenting with opinion.

Attorneys:

J. HART EVANS and LOUIS C. SMITH, JR., both of New York, N.Y., and

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PAUL A. ROSE, Washington, D.C., for appellants.

CLERENCE W. MOORE (JOSEPH SCHIMMEL of counsel) for Commissioner of Patents.

Judge:

Before WORLEY, Chief Judge, RICH, MARTIN, and SMITH, Associate Judges, and KIRKPATRICK, Judge. *

Opinion Text

Opinion By:

SMITH, Judge.

The Steele et al. U.S. patent application Ser. No. 532,283, filed Sept. 2, 1955 relates to "Polyoxyalkylene Products" which the specification says are chemical compounds having surface active properties. The specification asserts they are "useful as detergents either alone or fortified with builders, as emulsifying agents for aromatic hydrocarbons in water, and as dispersing agents."

The appealed claims were rejected by the examiner as "lacking invention" over the prior Jackson et al. U.S. patent No. 2,677,700 which issued May 4, 1954. In affirming this rejection, the Board of Appeals stated that "appellants' claimed compositions would be obvious," considering the Jackson et al. disclosure as a whole. The rejection on appeal appears, therefore, to be based on 35 U.S.C. 103 and shall be so treated in this opinion.

Appellants have selected claims 1 and 13 as typical of those on appeal. These claims are as

follows:

1. A polyglycol product consisting of a hydrophobe comprising an aliphatic monohydric alcohol containing between 1 and 8 carbon atoms having attached thereto a heteric mixed chain of ethylene oxide and 1,2-propylene oxide groups, the weight ratio of ethylene oxide groups to 1,2-propylene oxide groups being between 5 to 95 and 15 to 85 and the average molecular weight of said hydrophobe being at least 1000; and attached to said mixed chain a hydrophile comprising a chain of ethylene oxide groups, the weight ratio of hydrophile to hydrophobe being between 0.8 to 1 and 1.2 to 1.

13. A polyglycol product consisting of a hydrophobe comprising an aliphatic monohydric alcohol containing between 1 and 8 carbon atoms having attached thereto a heteric mixed chain of ethylene oxide and 1,2-propylene oxide groups, the weight ratio of ethylene oxide groups to 1,2-propylene oxide groups being about 10 to 90 and the average molecular weight of said hydrophobe being at least 1000; and attached to said mixed oxide chain a hydrophile comprising a chain of ethylene oxide groups, the weight ratio of hydrophile to hydrophobe being about 1 to 1.

As pointed out in the Jackson et al. reference the "surface active agent art is old and it is a well recognized principle that all such agents are relatively large molecules that contain both hydrophobic and hydrophilic elements," and further, that "It is recognized that to obtain optimum surface active properties it is desirable to have a proper balance between hydrophobic and hydrophilic elements." ¹

The relevant surface active agents disclosed by Jackson et al. are polymeric products in which each molecule contains two linked polyoxyalkylene chains, one hydrophobic and the other hydrophilic. For example, a polyoxypropylene chain will serve as the hydrophobic element and is formed by "condensing" propylene oxide with "an active hydrogen compound." A polyoxyethylene chain will serve as the hydrophilic element and this in turn is formed by "condensing" said hydrophobic element with ethylene oxide.

As active hydrogen compounds, Jackson et al. prefer those which: ²

* * * contain therein only aliphatic groups containing 1 to 5 carbon atoms as for example:

Aliphatic alcohols such as methanol, ethanol, propanol, isopropanol, butanol, secondary butanol, tertiary butanol, n-amyl alcohol, the monomethyl ether of ethylene glycol, the monomethyl ether of diethylene glycol, 2-chloroethanol, etc.

Jackson et al. also state:

A fundamental feature of this invention resides in the discovery that polyoxyalkylene chains, wherein the oxygen/carbon ratio is equal to or less than 0.33, are sufficiently hydrophobic at a critical chain length to serve as the hydrophobic element of surface active agents. [Emphasis ours.]

The teaching of the patentees is clear

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that a polyoxyethylene chain would have an oxygen/carbon ratio of 0.5 while a polyoxypropylene chain would have a ratio of 0.33. Further, to produce a polyoxyalkylene chain with an oxygen/carbon ratio *less* than 0.33, 1,2-alkylene oxides³ with a higher carbon content would be required. Examples of such oxides, according to Jackson et al., are butylene oxide and amylene oxide.

The surface active agents disclosed by appellants differ in certain respects from the agents of Jackson et al. which we have just described. Appellants' surface active agents are "prepared by the addition of controlled quantities of ethylene oxide to a hydrophobe of minimum molecular weight made by the heteric addition of a mixture of 1,2-propylene oxide and ethylene oxide to an aliphatic monohydroxy alcohol." Said hydrophobe must be prepared from a mixture of ethylene oxide and propylene oxide containing 5 to 15 percent by weight of ethylene oxide, and must have an average molecular weight of at least 1000.⁴ Stated examples of the "aliphatic monohydroxy alcohol" are "n-butanol, 2-ethylhexanol, methanol, ethanol, n-propanol, isobutanol, 2-ethylbutanol, n-heptanol and isopropanol."

It seems apparent to us that appellants' *hydrophobic* element, as disclosed in their specification, containing as it must a polyoxyalkylene chain with *both* oxypropylene and oxyethylene units, would not be in accord with what Jackson et al. have termed the "fundamental feature" of their invention, namely that the polyoxyalkylene chains of their hydrophobic element have an oxygen/carbon ratio of 0.33 or less. In other words, it seems to us appellants have gone beyond the express limits of Jackson et al. and have discovered that a mixture of propylene oxide and ethylene oxide is effective as a hydrophobic element of a surface active agent.

Appellants sought to overcome the rejection on the Jackson et al. reference by comparative tests which are described in the several affidavits of record. In affirming the examiner's rejection that the "single comparison" made in the tests does not establish patentability of the wide range of compositions being claimed, the board stated:

* * * the affidavits may be accepted as demonstrating the superiority of the samples of appellants' polymers employed in these tests over samples of the polymers of the reference patent. We agree however with the examiner's holding that the affidavits do not establish the patentability of the wide range of compositions covered by the appealed claims.

We are unable to understand the board's phrase "patentability of the wide range of compositions covered by the appealed claims." This becomes even more of an enigma when we study the board's opinion and find that the board supports its position by saying:

The language of these claims, including such terms as "comprising an aliphatic monohydroxy alcohol containing between 1 and 8 carbon atoms," (covering such alcohols

as the monoalkyl ethers of ethylene glycol used by Jackson et al.) and "comprising a chain of ethylene oxide groups" (allowing the inclusion of such water solubilizing groups as the sulphate, phosphate and borate of Jackson et al.), cover compounds which are more nearly akin to detergents described by the reference than the materials actually disclosed in appellants' specification. In these circumstances, the reported comparisons fall short of indicating the patentability of the appealed claims.

While the claims on appeal contain the language quoted by the board, we do not find in appellants' specification *any* composition, let alone a "wide range" of compositions, which supports the board's position that "a wide range of compositions is covered by "the appealed claims."

Reference to claim 1 indicates that the "product" therein recited consists of a "hydrophobe" and a "hydrophile" which, *as claimed*, are said to comprise, respectively, a "chain of ethylene oxide and 1,2-propylene oxide groups," and a "chain of ethylene oxide groups." Consultation of numerous technical dictionaries and text books indicates that the terms "ethylene oxide" and "1,2-propylene oxide," as used by those skilled in this art, designate chemical compounds or molecules and *not* "groups" as claimed. A chemical "group" appears to be but *part* of the structure of a complete molecule. There is nothing in the specification to indicate that these terms are used in the claims in other than their accepted technical meanings. We question, therefore, whether the disclosed compound can be said to comprise either a "chain of ethylene oxide groups" or a

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"chain of ethylene oxide and 1,2-propylene oxide groups" as claimed. It appears from the specification that ethylene oxide and 1,2-propylene oxide are used solely as *reactants* to *produce* these chains so that after the reaction these starting materials are not present per se as "chain" units.

Next, we observe that the "hydrophobe" portion of the claimed "product" comprises "an aliphatic monohydric alcohol containing between 1 and 8 carbon atoms having attached thereto a heteric mixed chain." ⁵ It is our understanding that even in the case of the simplest alcohol, methanol, CH₃OH, there is more than one possible point of attachment and more than one possible mode of attachment for such a "chain." For example, the alcoholic hydroxy group might be left intact or might be altered when the "chain" is "attached" to said "alcohol." The specification actually discloses only the use of the alcohol as a *reactant* which is transformed into a non-alcoholic group, specifically either an alkyl or an alkoxy group, ⁶ when it becomes a part of the final "polyoxyalkylene monoalkyl ether" or "alkyl monoether of a heteric oxyethylene-oxypropylene diol," these being the only type of "polyglycol product" ⁷ disclosed.

Thus the "product" claimed has been defined in claim 1 *partially* in terms of the reactants used to produce it, namely the aliphatic monohydric alcohol, ethylene oxide, and 1,2-propylene oxide. To this extent, this claim, and the other appealed claims, are of a product-by-process

nature. However, other claim terms such as "polyglycol" and "chain" can be construed reasonably only as references to the *structure* of the claimed "product."

The interpretation of the claim, which was apparently adopted by the Patent Office, if we properly understand the rejection, is that the claim covers each chemical compound which would be produced in the reaction of the monohydric alcohol with the mixture of the ethylene and propylene oxide called for in the claim. The difficulty we find with this interpretation is that it ignores the term "heteric" which is present in the claim. Applicant contends that the word "heteric" refers to random distribution of the oxyethylene and oxypropylene groups in the hydrophobe. If the claim is construed as a claim generic to all possible individual compounds, as the examiner and the board appear to have done, the concept of a "mixed chain" might apply to the hydrophobe. However, this interpretation ignores the concept of randomness which is inherent in the term "heteric." We think the term "heteric" in the claims requires that a large number of different configurations of the hydrophobe be present at the same time.

[1] Our analysis of the claims indicates that considerable speculation as to meaning of the terms employed and assumptions as to the scope of such claims were made by the examiner and the board. We do not think a rejection under 35 U.S.C. 103 should be based on such speculations and assumptions. There is an admission by the board that the affidavits submitted show superiority of "samples of appellants' polymers employed in these tests over samples of the polymers of the reference patent." Before it can be held that the claims on appeal cover "a wide range of compositions," it is essential to know what the claims do in fact cover. As we have previously indicated, our analysis of the claims leaves us in a quandary as to what in fact is covered by them. We think the examiner and the board were wrong in relying on what at best are speculative assumptions as to the meaning of the claims and basing a rejection under 35 U.S.C. 103 thereon.

Our study of the lengthy record of the Patent Office prosecution provides ample support for our conclusion that substantial confusion exists in the record at all levels of the prosecution as to the proper interpretation to be given to the appealed claims. We believe that this confusion arose and has continued because the claims do not particularly point out and distinctly claim the invention as required by 35 U.S.C. 112.

We therefore have decided to resolve the issue herein by reversing the decision below because we find it based on unsupported speculative assumptions.

Our decision is not to be construed as meaning that we consider the claims on appeal to be patentable as presently drawn. These claims should, it seems to us, be reviewed to insure compliance with 35 U.S.C. 112. See *In re Citron*, 45 CCPA 773, 251 F.2d 619, 116 USPQ 409 .

The decision of the Board of Appeals is *reversed*.

Footnotes

Footnote 1. The following from Webster's New International Dictionary, 2d Ed. (1949) is relevant:

hydrophile * * * adj. * * * Physical chem. Having or denoting a strong affinity for water; * * *.

hydrophobe * * * adj. * * * Lacking strong affinity for water; * * *.

Footnote 2. In addition to the specific compounds set forth herein, Jackson et al. list 29 other specific preferred compounds within 5 other compound classes.

Footnote 3. The generic term "1,2-alkylene oxide" appears to include ethylene oxide and propylene oxide.

Footnote 4. Jackson et al. state that the number of oxyalkylene units in the hydrophobe, expressed as "n", "must be greater than 6.4". Using oxypropylene (which has an oxygen/carbon ratio of 0.33) as the unit, the minimum molecular weight of Jackson et al.'s hydrophobe can be calculated to be about 371.

Footnote 5. We question whether an alcohol "containing between 1 and 8 carbon atoms" includes methanol and 2-ethylhexanol as required by dependent claims 17 and 21, respectively.

Footnote 6. In the case of methanol, these would be methyl, CH₃-, or methoxy, CH₃O-.

Footnote 7. Hackh's Chemical Dictionary, 3d Ed. (1944), defines "polyglycol" as: "A dihydroxyether formed from two or more glycol molecules by dehydration."

Concurring Opinion Text

Concur By:

MARTIN, Judge, concurring.

I agree with the majority that the board erred in rejecting on 35 U.S.C.

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103 the claims at bar since the rejections were based on meanings of the claims which were established by "speculative assumptions" of the board. However, I know of no statute, nor does the majority cite one, which gives this court the authority to point out to the board a possible new basis for rejection that the board may have overlooked in this case. ¹ It seems to me that such judicial prompting is unwarranted. In my opinion this court has no right to take this action which may affect adversely litigants' rights in the claims as drawn.

Footnotes

Footnote 1. No statutory authority is cited by this court for taking similar action in *In re Citron*, 45 CCPA 773, 251 F.2d 619, 116 USPQ 409 .

Dissenting Opinion Text

Dissent By:

WORLEY, Chief Judge, dissenting.

I respectfully suggest that the quandary in which the majority finds itself is purely of its own making and wholly unnecessary. Applicants for patents have complete freedom in phrasing their claims. If the language they employ is of such a nature as to run afoul of the prior art, as is clearly the case here, then the Patent Office is obliged to reject such claims. They have properly done so here.

The examiner, the board, and appellants agree that the claims call for a compound. Despite that accord by those presumably skilled in this particular art, the majority feels obliged to disregard that unanimity of view and substitute instead our own limited knowledge of advanced chemistry.

I would remind my colleagues that Congress has seen fit to restrict the jurisdiction of this court. 35 U.S.C. 144 clearly states that our decisions "shall be confined to the points set forth in the reasons of appeal." Since the parties agree what the claims cover, this court has no authority to go so far afield as it is doing here.

The majority concludes by saying:

Our decision is not to be construed as meaning that we consider the claims on appeal to be patentable as presently drawn. These claims should, it seems to us, be reviewed to insure compliance with 35 U.S.C. 112. See *In re Citron*, 45 CCPA 773, 251 F.2d 619, 116 USPQ 409 .

I agree with the first sentence since our decisions should never be construed as deciding any issues other than those raised in the reasons of appeal. However, this court has no business suggesting to the Patent Office that it review matters not raised in the reasons of appeal. If *Citron* stands for such a proposition, the quicker it is overruled the better for the litigants, the Patent Office and this court.

Footnote * United States Senior Judge for the Eastern District of Pennsylvania, designated to participate in place of Judge O'CONNELL, pursuant to provisions of Section 294(d), Title 28, United States Code.

- End of Case -